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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/617,747 | 07/14/2003 | Nobuko Okada | 109100.01 | 3043 |

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

| EXAMINER | |
|---|---|
| LIN, JAMES | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1762 | |

DATE MAILED: 09/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/617,747 | OKADA ET AL. | |
| | Examiner | Art Unit | |
| | Jimmy Lin | 1762 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *3,4,11,12,15 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-10,13 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/820,650.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/14/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Group I in the reply filed on 7/17/06 is acknowledged. The traversal is on the ground(s) that the search and examination of the entire application could be made without serious burden. This is not found persuasive because a serious burden exists in the differing issues likely to arise during the prosecution of the different inventions.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 3-4, 11-12, and 15-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7/17/06.

### *Claim Objections*

3. Claims 1-2 are objected to because of the following informalities: the preamble of the claims recites "thin file suing". The Examiner believes that the Applicant meant to recite "thin film using". Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-2, 5-10, and 13-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. The term "low partial vapor pressure" in claims 1-2, 5-10, and 13-14 is a relative term which renders the claim indefinite. The term "low partial vapor pressure" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For

the purpose of this examination, the term will be interpreted to be inclusive of any partial vapor pressure.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 7-10 and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al. (U.S. Patent 6,830,494).

Yamazaki discloses a method of making an organic EL device, the method comprising:

forming first electrodes 112;

forming banks 105 (Fig. 1C);

forming a second electrode 48 (Fig. 5);

discharging liquid droplets containing organic EL material and a solvent from an ink-jet printer to a substrate over the first electrodes (col. 10, lines 62-64; Fig. 1C);

removing and controlling (i.e., in a controlled environment such as in a baking chamber) a solvent vapor evaporating from a droplet arranged previously on the substrate (col. 12, lines 26-31);

discharging liquid droplets with a solvent having a partial vapor pressure;

Claims 13-14: The EL layer can be a four-layer structure comprising a hole-injection/transportation layer and a light emitting layer.

9. Claims 7, 9, and 13 rejected under 35 U.S.C. 102(b) as being anticipated by Miyashita et al. (WO 98/24271; references are made to the English equivalent U.S. Patent 6,863,961).

Miyashita discloses a method of making an organic EL device (abstract), the method comprising:

forming first electrodes 101,102,103;

forming banks 105;

forming a second electrode 113 (Fig. 1);

discharging liquid droplets containing an organic EL material and a solvent from an ink-jet printer over the first electrode (col. 5, lines 5-12; col. 7, lines 44-46);

discharging liquid droplets with the solvent having a partial pressure.

Miyashita does not explicitly teach removing a solvent vapor evaporating from a droplet arranged previously on the substrate. However, the ink-jet printing process occurs over a finite period of time and at least some of the solvent will be evaporated (i.e., removed). In addition, heat can be applied to conjugate the polymer precursor components (col. 5, lines 20-25), and the heat would remove at least some of the solvent.

Claim 13: Miyashita teaches that the luminescent layer 108 can be made of a hole injection material (col. 5, lines 44-63) and that the luminescent layer 108 can be deposited over luminescent layers 106,107.

### *Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki '494.

Yamazaki is discussed above, but does not explicitly teach that the organic EL material is discharged while the ink-jet head is moving relative to the substrate. However, Yamazaki teaches that the EL device can be patterned into stripes (Fig. 1). In order to form the stripes, the ink-jet head can be moved incrementally or continuously. The continuous deposition would

reduce the time required to form the stripe patterns. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have continuously discharge the organic EL material while the ink-jet head is moving. One would have been motivated to do so in order to increase the production rate.

12. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Iguchi et al. (WO 98/27570; references are made to the English equivalent U.S. Publication 2002/0009536).

Miyashita is discussed above, but does not explicitly teach that the ink is discharged while the ink-jet head is moved relative to the substrate. However, Iguchi teaches a method of making a plasma display (i.e., a type of EL device), wherein the organic EL materials are ink-jet printed the banks on a substrate. The EL layers are patterned into stripes (abstract; Fig. 1). The ink must necessarily be ejected while the ink-jet head is moving in order to form the stripe pattern. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have patterned the organic EL layers of Miyashita in stripes because Iguchi teaches that such a pattern is suitable for making an EL device.

13. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Yamazaki '494 for substantially the same reasons as above.

14. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Iguchi '570, and further in view of Wolk et al. (U.S. Patent 6,194,119).

Miyashita and Iguchi are discussed above, but do not teach controlling the solvent vapor evaporating (i.e., controlling the evaporation in a controlled environment) from a droplet arranged previously on a substrate. However, Wolk teaches that conventional patterning methods of EL materials using a solvent, such as ink-jet printing, can damage, dissolve, penetrate, and/or render inoperable previously coated or patterned materials. Miyashita teaches that the organic EL materials can be heated under a nitrogen atmosphere to polymerize precursor

compositions (Examples 1-2 and 4-5). One of ordinary skill in the art would have recognized that applying heat to a substrate would evaporate the solvent and that drying the solvent in the polymerization chamber would reduce the amount of equipment needed for the process. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have dried the solvent from the EL layers using the controlled environment of the polymerization chamber. One would have been motivated to do so in order to prevent damage to the underlying layers and to reduce the equipment needed.

15. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Yamazaki '494, and further in view of Wolk '119 for substantially the same reasons as above.

16. Claims 8, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Iguchi '570, and further in view of Wolk '119 for substantially the same reasons as above.

17. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Iguchi '570 and Wolk '119, and further in view of Miller et al. (U.S. Patent 6,107,452).

Miyashita and Iguchi are discussed above, but do not teach controlling the solvent vapor evaporating (i.e., controlling the evaporation in a controlled environment) from a droplet arranged previously on a substrate. However, Wolk teaches that conventional patterning methods of EL materials using a solvent, such as ink-jet printing, can damage, dissolve, penetrate, and/or render inoperable previously coated or patterned materials. The Examiner takes Official Notice that evaporating the solvent in a controlled environment of a chamber is well known in the art (see, e.g., Miller, Example 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have evaporated the solvent in a controlled environment of a chamber. One would have been motivated to do so in order to prevent the solvent from damaging underlying layers.

18. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Yamazaki '494 and Wolk '119, and further in view of Miller et al. (U.S. Patent 6,107,452).

19. Claims 8, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita '271 in view of Iguchi '570 and Wolk '119, and further in view of Miller '452 for substantially the same reasons as above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Thursday 8 - 5:30 and Friday 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JL
JL

B. Chen

**BRET CHEN**
**PRIMARY EXAMINER**